

1        **What is claimed is:**

2            1.     A USB system for data communication between a processor and  
3 IDE devices, comprising:  
4                      a plurality of IDE devices;  
5                      a plurality of USB-to-IDE bridges, wherein each IDE device is  
6 connected to a respective USB-to-IDE bridge; and  
7                      a USB controller, wherein the USB-to-IDE bridges are connected to  
8 the USB controller, whereby the processor can communicate with the IDE  
9 devices via the USB controller.

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11            2.     The system of claim 1, wherein at least one of the IDE devices  
12 comprises a hard disk drive.

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15            3.     The system of claim 1, further comprising one or more USB hubs,  
16 each USB hub connected between two or more USB-to-IDE bridges and a USB  
17 controller.

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19            4.     The system of claim 1, wherein each IDE device can be utilized in  
20 hot plugging.

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22            5.     The system of claim 1, wherein one or more IDE devices can be  
23 disconnected from the system while the system is operating.

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25            6.     The system of claim 1, wherein at least one additional IDE device  
26 coupled to a corresponding USB-to-IDE bridge can be connected to the USB  
27 controller while the system is operating.

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29            7.     The system of claim 1, further comprising at least one USB hub  
30 connected between a number of the USB-to-IDE bridges and one of the USB

1 controllers, whereby the processor can communicate with the IDE devices via the  
2 USB controller and the USB hub.

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4 8. The system of claim 7, wherein one or more IDE devices can be  
5 disconnected from the system while the system is operating.

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7 9. The system of claim 1, wherein at least one additional IDE device  
8 coupled to a corresponding USB-to-IDE bridge can be connected to the hub  
9 while the system is operating.

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11 10. A method for connecting multiple IDE devices to a processor for  
12 data communication, comprising the steps of:

13 providing multiple USB-to-IDE bridges;  
14 connecting each IDE device to a respective one of the USB-to-IDE  
15 bridges;  
16 providing a USB controller; and  
17 connecting the USB-to-IDE bridges to the USB controller, whereby the  
18 processor can communicate with the IDE devices via the USB controller.

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20 11. The method of claim 10, wherein at least one of the IDE devices  
21 comprises a disk drive.

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23 12. The method of claim 10, further comprising the steps of hot  
24 plugging one or more IDE devices to the USB-to-IDE bridges.

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26 13. The method of claim 10, further comprising the steps of  
27 disconnecting one or more of the IDE devices from the system while the system  
28 is operating.

1       14. The method of claim 10, further comprising the steps of connecting  
2 at least one additional IDE device coupled to a corresponding USB-to-IDE  
3 bridge, to the USB controller while the system is operating.

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5       15. The method of claim 10, further comprising the steps of:  
6 providing at least one USB hub;  
7 connecting each hub to a USB controller; and  
8 connecting two or more USB-to-IDE controllers to each hub, such that  
9 each hub is connected between a USB controller and two or more USB-to-IDE  
10 controllers.

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12       16. The method of claim 15, further comprising the steps of  
13 disconnecting one or more of the IDE devices from the system while the system  
14 is operating.

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16       17. The method of claim 15, further comprising the steps of connecting  
17 at least one additional IDE device coupled to a corresponding USB-to-IDE  
18 bridge, to one of the hubs while the system is operating.

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20       18. A data storage system, comprising:  
21              a plurality of IDE storage devices;  
22              a plurality of USB-to-IDE bridges, wherein each IDE storage device  
23 is connected to a respective USB-to-IDE bridge; and  
24              a USB controller, wherein the USB-to-IDE bridges are connected to  
25 the USB controller, whereby the processor can communicate with the IDE  
26 storage devices via the USB controller.

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28       19. The data storage system of claim 18, further comprising a carrier  
29 for each IDE data storage device, such that each IDE disk drive and  
30 corresponding USB-to-IDE bridge are stored in the respective carrier.

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1           20. The data storage system of claim 18, wherein one or more IDE  
2 storage devices can be disconnected from the system while the system is  
3 operating.

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5           21. The data storage system of claim 18, wherein at least one  
6 additional IDE disk device coupled to a corresponding USB-to-IDE bridge can be  
7 connected to the USB controller while the system is operating.

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9           22. The data storage system of claim 18, further comprising at least  
10 one USB hub connected between a number of the USB-to-IDE bridges and one  
11 of the USB controllers, whereby the processor can communicate with the IDE  
12 devices via the USB controller and the USB hub.

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14          23. The data storage system of claim 18, further comprising one or  
15 more USB hubs, each USB hub connected between two or more USB-to-IDE  
16 bridges and a USB controller.

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18          24. The data storage system of claim 23, wherein at least one or more  
19 IDE storage devices can be disconnected from the system while the system is  
20 operating.

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22          25. The data storage system of claim 23, wherein at least one  
23 additional IDE storage device coupled to a corresponding USB-to-IDE bridge  
24 can be connected to one of the USB hubs while the system is operating.

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26          26. The data storage system of claim 23, wherein at least one  
27 additional IDE storage device coupled to a corresponding USB-to-IDE bridge and  
28 associated hub, can be connected to the USB controller while the system is  
29 operating.

1        27. The data storage system of claim 23, wherein at least one IDE  
2 storage device coupled to a corresponding USB-to-IDE bridge and associated  
3 hub, can be disconnected to the USB controller while the system is operating.

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